

What is claimed is:

1. An ion exchange membrane comprising:

(A) a porous film layer having pores with an average pore diameter of 0.01 to 2 μm ; and

5 (B) a surface layer existent on at least one side of the porous film,

wherein the pores of the porous film layer (A) are filled with an ion exchange resin and the surface layer comprises (a) an inorganic filler having an average primary
10 particle longest diameter which is 0.1 time or more the average pore diameter of the pores of the porous film layer and 50 μm or less and (b) an ion exchange resin.

2. The ion exchange membrane of claim 1, wherein the
15 inorganic filler is a lamellar particle having an aspect ratio of 50 to 2,000.

3. A process for producing the ion exchange membrane of claim 1, comprising the steps of:

20 (1) contacting a porous film having pores with an average pore diameter of 0.01 to 2 μm to a suspension containing an inorganic filler having an average primary particle longest diameter which is 0.1 time or more the average pore diameter of the pores of the porous film and 50 μm or less and a
25 polymerizable monomer selected from the group consisting of a polymerizable monomer which provides an ion exchange resin when it is polymerized and a polymerizable monomer which provides an ion exchange resin precursor when it is
polymerized in order to infiltrate the suspension into the
30 pores of the porous film and to adhere the suspension to the surface of the porous film;

(2) polymerizing the polymerizable monomer contained in the suspension in the pores and on the surface of the porous film; and

(3) converting the ion exchange resin precursor into an ion exchange resin when the ion exchange resin precursor is obtained by polymerization in the step (2).

5 4. A process for producing the ion exchange membrane of claim 1, comprising the steps of:

(1) contacting a porous film having pores with an average pore diameter of 0.01 to 2 μm to a suspension containing an inorganic filler having an average primary particle longest
10 diameter which is 0.1 time or more the average pore diameter of the pores of the porous film and 50 μm or less, a resin selected from the group consisting of an ion exchange resin and an ion exchange resin precursor, and a solvent in order to infiltrate the suspension into the pores of the porous
15 film and to adhere the suspension to the surface of the porous film;

(2) removing the solvent contained in the suspension in the pores and on the surface of the porous film; and

(3) converting the ion exchange resin precursor into an
20 ion exchange resin when the suspension in the step (2) contains the ion exchange resin precursor.

5. A diaphragm for a direct methanol type fuel cell which comprises the ion exchange membrane of claim 1.

25

6. A direct methanol type fuel cell comprising the diaphragm for a direct methanol type fuel cell of claim 5.